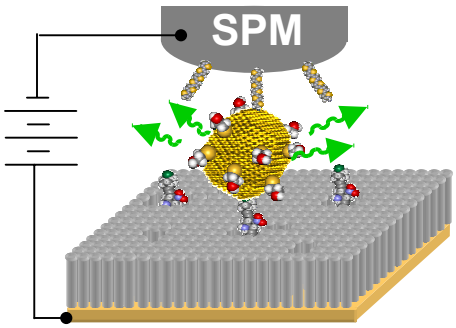
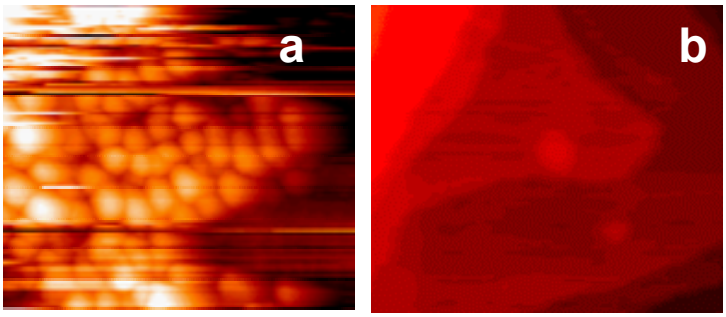


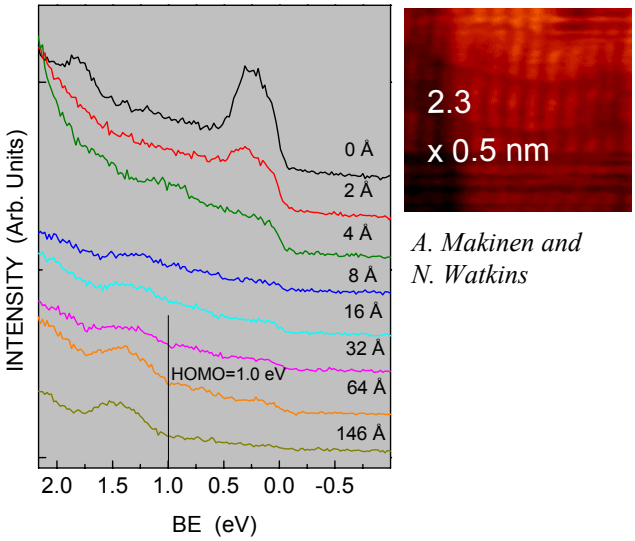

Fig. 1 — Schematized nano light-emitting device. Conducting molecules (green tipped) supported by a self-assembled monolayer (grey rods) connect the substrate electrode (gold) to a semiconducting QD. The molecularly functionalized tip of a scanning probe microscope completes the circuit.


Fig. 2 — Highly versatile apparatus for conducting scanning tunneling and atomic force microscopy experiments (i.e., SPM) as well as photoelectron spectroscopies (PES), which determine electronic energy levels and chemical bonding.




*A. Makinen and E. Foos*

Fig. 3 — (a) Scanning tunneling microscope images of rafts of ~5-nm diameter gold nanocrystals (NCs) assembled on an alkane dithiol self-assembled monolayer. (b) Individual NCs are also present.




*A. Makinen and N. Watkins*

Fig. 4 — Illustration of the alignment of energy levels between a Au substrate and progressively thicker layers of α-sexithiophene as measured by ultraviolet photoemission spectroscopy. Scanning tunneling microscope image shows an ordered SAM of the molecules at 4 Å deposition thickness.

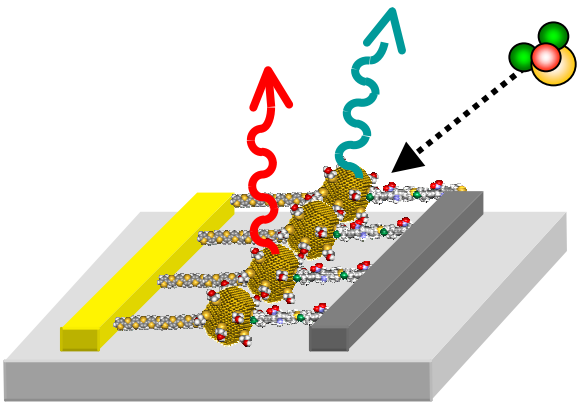


Fig. 5 — Hypothetical self-assembled chemical sensor using colloidal QDs with integrated optical readout. Functionalization of the QD surfaces and colorometric analysis achieves specificity while the quantum size of the emitters lends high sensitivity.